

ABSTRACT

5 A camera array captures plural component images  
which are combined into a single scene from which  
"panning" and "zooming" within the scene are performed.  
In one embodiment, each camera of the array is a fixed  
digital camera. The images from each camera are warped  
and blended such that the combined image is seamless  
with respect to each of the component images. Warping  
10 of the digital images is performed via pre-calculated  
non-dynamic equations that are calculated based on a  
registration of the camera array. The process of  
registering each camera in the arrays is performed  
either manually, by selecting corresponding points or  
15 sets of points in two or more images, or automatically,  
by presenting a source object (laser light source, for  
example) into a scene being captured by the camera  
array and registering positions of the source object as  
it appears in each of the images. The warping  
20 equations are calculated based on the registration data  
and each scene captured by the camera array is warped  
and combined using the same equations determined  
therefrom. A scene captured by the camera array is  
zoomed, or selectively steered to an area of interest.  
25 This zooming or steering, being done in the digital  
domain is performed nearly instantaneously when  
compared to cameras with mechanical zoom and steering  
functions.